Canadian Centre for Occupational Health and Safety

Centre canadien d'hygiène et de sécurité au travail

TOXOPLASMOSIS

A Summary of the Occupational Health Concern

P89 - 19E

89-05561/

TOXOPLASMOSIS

A Summary of the Occupational Health Concern

Erica Counter

Canadian Centre for Occupational Health and Safety

August 1989

CCOHS/CCHST

TOXOPLASMOSIS--A SUMMARY OF THE OCCUPATIONAL HEALTH CONCERN

This publication was prepared as a source of information for health and safety committees and others with an interest in understanding and reducing the occupational risk of toxoplasmosis.

Each publication produced by CCOHS undergoes several stages of review. As a part of this review, representatives from government, employers, and labour are requested to comment on draft copies of CCOHS documents for technical accuracy and readability.

Although every effort is made to ensure accuracy and completeness of the information, it is understood that CCOHS makes no warranty as to the accuracy or completeness of such information and assumes no liability for any damages or loss suffered as a result of any inaccuracy or incompleteness therein.

In the interest of the widest possible dissemination of occupational health and safety information, CCOHS invites users to copy and distribute its publications. Appropriate written acknowledgment of CCOHS is both requested and appreciated. CCOHS asks that users report the number of copies so distributed--please notify the Inquiries Service.

Cette publication est offerte en français sous le titre : La toxoplasmose -- Un résumé des risques sur le plan professionnel.

CCOHS NUMBER P89-19E
ISBN 0-660-13270-2
DSS CATALOGUE NUMBER CC273-2/89-19E

Published 1989

---

250 Main Street East
Hamilton Ontario
L8N 1H6
416-572-2981
FAX 416-572-2206
Telex 061-8532

CCOHS/CCHST

TABLE OF CONTENTS

1.	WHAT IS TOXOPLASMOSIS?	1
2.	WHAT CAUSES TOXOPLASMOSIS?	1
3.	HOW IS TOXOPLASMOSIS TRANSMITTED?	1
	Congenital Toxoplasmosis	1
	Acquired Toxoplasmosis	2
4.	WHAT OCCUPATIONS ARE AT RISK?	2
5.	WHAT ARE THE SYMPTOMS AND SIGNS OF TOXOPLASMOSIS?	2
6.	WHAT IS THE TREATMENT FOR TOXOPLASMOSIS?	3
7.	HOW CAN WE PREVENT TOXOPLASMOSIS?	3
	Specific Precautions	3
	General Precautions	4
	FURTHER READING	5

CCOHS/CCHST

1. WHAT IS TOXOPLASMOSIS?

Toxoplasmosis is an infectious disease that spreads from animals to humans. It is a common disease that is seldom recognized because most infected people do not become sick. In those who do have symptoms of the disease, the illness is mild, with swollen lymph nodes and some discomfort. Estimates suggest that one-third of Canadians have been infected. The number of toxoplasmosis cases of occupational origin is not known.

2. WHAT CAUSES TOXOPLASMOSIS?

The microorganism *Toxoplasma gondii* causes toxoplasmosis. It infects wild and domestic animals including birds, cats, sheep, goats, cattle, pigs and poultry.

Two forms of *Toxoplasma gondii* are usually responsible for transmitting the disease--oocysts and cysts.

The cat family plays an important role in spreading the microorganism. Cats can be infected with any form of the microorganism when they eat prey animals with infected tissues. Cats shed millions of oocysts in their feces. Oocysts are microscopic round bodies. These oocysts can survive in soil for several months and are a major source of infection. Once swallowed, the oocyst bursts in the intestines and spreads to the rest of the body through the bloodstream. *Toxoplasma gondii* can form cysts, which are sacs filled with microorganisms, in many tissues of the infected body. Cysts are found chiefly in the skeletal and heart muscles, the central nervous system, and the eyes.

3. HOW IS TOXOPLASMOSIS TRANSMITTED?

Toxoplasmosis is transmitted to humans in two ways. Direct transmission occurs when a pregnant woman passes the infection to her fetus (congenital toxoplasmosis). Indirect transmission occurs when people come into contact with food, water, soil or animals contaminated with *Toxoplasma gondii* (acquired toxoplasmosis).

Congenital Toxoplasmosis

A pregnant woman who acquires toxoplasmosis infection can pass the organism to the developing fetus through the placenta. The risk of the fetus being affected and the severity of the disease depends on what stage during pregnancy the

mother acquires the infection. The infection can result in spontaneous abortion, stillbirth or premature birth. If the pregnancy is carried to full term, there is the possibility that after birth, cysts may cause blindness, heart and brain defects and death.

Acquired Toxoplasmosis

Acquired toxoplasmosis occurs from eating improperly cooked lamb, mutton, pork, goat or beef, or from drinking unpasteurized goat milk contaminated with *Toxoplasma gondii*. *Toxoplasma gondii* can also be transmitted by handling contaminated animals or raw meat or having contact with food, water or dust contaminated with cat feces. If hands are not washed after contact or before eating or drinking, the organism is transferred from the hands to the mouth and is then swallowed. It is not known whether insects are involved in the transmission. Infection from blood transfusions and organ transplants from infected donors has also been reported. *Toxoplasma gondii* has been found in the kidneys, bladder and intestines of infected humans. Contaminated human urine and feces could possibly be a source of infection, but transmission from this source has not been proved.

4. WHAT OCCUPATIONS ARE AT RISK?

Sources of occupational infection include contact with infected raw meat, infected animals or contact with contaminated cat feces. Laboratory personnel who have handled contaminated needles or glassware have also contracted toxoplasmosis.

Toxoplasmosis is an occupational risk for:

- animal care workers including breeders, keepers, zoo attendants, veterinarians or their associates
- slaughterhouse workers, meat inspectors, line processors, butchers or cooks
- agricultural workers
- landscapers and gardeners
- laboratory workers
- health care workers

5. WHAT ARE THE SYMPTOMS AND SIGNS OF TOXOPLASMOSIS?

Toxoplasmosis is seldom diagnosed or reported because most victims have no sign or symptom of the disease. Some short-term effects of toxoplasmosis may include fever, muscle pain, sore throat, headache, swollen lymph nodes (usually in the neck) and an enlarged spleen. Unless tests are carried out to confirm infection, these symptoms can be taken for "flu." The long-term or chronic effects of the infection result when the cysts spread to the brain and muscle cells.

The cysts, which can stay in the body as long as the person lives, can rupture and cause severe illness. Another form of the disease can also affect the eyes leading to partial loss of sight or to blindness in one or both eyes. This can occur in both congenital and acquired toxoplasmosis. Although toxoplasmosis can affect any organ in the body, the lymph nodes, skeletal and heart muscles, and the brain are most commonly involved.

The time between contact with the infected source and development of the disease is not known. In one outbreak caused by eating under cooked meat, the disease developed 10 to 23 days after exposure. Another outbreak caused by contact with contaminated cat feces occurred 5 to 20 days after exposure.

6. WHAT IS THE TREATMENT FOR TOXOPLASMOSIS?

Medical advice should be sought if infection is suspected. The need for and the length of treatment depends on the severity of the infection or the possibility of damage to vital organs. Toxoplasmosis is treated primarily with antibacterial and anti-parasitic drugs, for about four weeks.

Laboratories can perform blood and tissue tests to confirm infection with *Toxoplasma gondii*.

7. HOW CAN WE PREVENT TOXOPLASMOSIS?

Specific Precautions

Animal Care Workers

Dispose of cat feces daily. Flush feces down the toilet, carefully bag them for disposal, burn them or bury them deeply. Wear disposable gloves when handling litter boxes or working in soil or sand that is possibly contaminated with cat feces. The oocysts are resistant to common disinfectants. Expose them to 10 percent ammonium hydroxide, 7 percent tincture of iodine, a dry heat above 60°C or boiling water to kill them.

Zoo Attendants

House all members of the cat family in a separate building to prevent infecting other zoo animals. Do not feed cats raw meat. If this is not possible, feed meat that has been previously frozen as it is less likely to be infective than fresh meat. Beef is likely to contain less *Toxoplasma gondii* than horse meat, mutton or pork. Autoclave or heat to 70°C, for at least 10 minutes, brooms, shovels and other equipment used to clean cat cages or enclosures. Wear masks and protective clothing when cleaning cages. Remove all feline feces daily.

Slaughterhouse Workers, Meat Inspectors, Line Processors, Butchers, Cooks and Others Contacting Raw Meat

Wash hands thoroughly with soap and water. Do not touch mouth and eyes when handling raw meat. Wash all cutting boards, knives, sink tops and other materials that come into contact with raw meat with soap and water. Control roaches or other insects that can come into contact with food or areas where food is prepared. They may transfer oocysts to uncovered food.

Agricultural Workers

Soil can be a source of transmission, particularly if it is used by cats. Wash hands after working in the soil or after contacting animals. Confirm the cause of abortion in animals. Send the placenta, fetus and body fluids to a laboratory to confirm the presence of *Toxoplasma gondii*. Ensure that rats and cats do not have contact with these tissues. Do not handle fetal membranes and dead fetuses with bare hands. Fetal material that is not sent to the laboratory should be buried or incinerated. Remove dead pigs and other dead animals immediately to prevent cannibalism by pigs and scavenging by cats. Do not allow cats access to stored grain. Remove all cat feces from grain. Keep grain covered to prevent contamination. Keep only adult barn cats by spaying females and driving new cats away.

Landscapers and Gardeners

Wear gloves to avoid exposure to *Toxoplasma gondii* when contacting soil contaminated with infected cat feces. Wash hands after removing gloves.

Laboratory Workers

Wear gloves at all times when handling cat feces. Also avoid contaminating centrifuges, benches or microscopes when handling feces.

Health Care Workers

Transmission of the disease from contaminated human urine and feces has not been proved. As a precaution, always wear disposable gloves when handling patients who have poor bowel control. Wash hands and nails thoroughly with soap and water after removing gloves.

General Precautions

- Wear disposable gloves when gardening or cleaning litter boxes, if contact is unavoidable. All pregnant women should avoid potential sources of infection.
- Feed pet cats only dry, canned or cooked food. Try to keep pet cats indoors to discourage scavenging for food.
- Eat meat that has been thoroughly smoked, cured or cooked.
- Wash fruits and vegetables before eating. Do not eat raw eggs.
- Do not drink unpasteurized milk from goats.

FURTHER READING

Carter, A.O. et al. Congenital toxoplasmosis: epidemiologic features and control. Canadian Medical Association Journal. Vol. 135, no. 6 (1986) p. 618-623.

Cecil textbook of medicine. Vol. 2. Edited by J.B. Wyngaarden et al. 17th edition. Philadelphia: W.B. Saunders Company, 1985. p. 1792-1796.

Dubey, J.P. Toxoplasmosis. Journal of the American Veterinary Medical Association. Vol. 189, no. 2 (1986) p. 166-170.

Control of communicable diseases in man. A.S. Benenson, editor. 14th edition. Washington: The American Public Health Association, 1985. p. 392-394.

Encyclopaedia of occupational health and safety. Vol. 2 (L-Z). Technical editor, L. Parmeggiani. 3rd (revised) edition. Geneva: International Labour Office, 1983. p. 2193-2194.

Gurevich, I. et al. Caring for the infectious patient: risk factors during pregnancy. Infection Control. Vol. 5, no. 10 (1984) p. 482-488.

Harrison's principles of internal medicine. Editors, R.G. Petersdorf et al. 11th edition. New York: McGraw-Hill Book Company, 1987. p. 791-797.

Jacobs, L. Toxoplasmosis. Israel Journal of Medical Sciences. Vol. 1, no. 4, part 1 (1965) p. 511-513.

Krick, J.A. et al. Toxoplasmosis in the adult: an overview. The New England Journal of Medicine. Vol. 298, no. 10 (1978) p. 550-553.

Maxcy-Rosenau public health and preventive medicine. Editor, J.M. Last. 12th edition. Norwalk, Conn.: Appleton-Century-Crofts, 1986. p. 445-448.

McCabe, R. et al. Toxoplasmosis: the time has come. The New England Journal of Medicine. Vol. 318, no. 5 (1988) p. 313-315.

Tizard, I.R. et al. Some observations on the epidemiology of toxoplasmosis in Canada. Journal of Hygiene, Camb. Vol. 77, no. 11 (1976) p. 11-21.

Toxoplasmosis as a significant disease in man and animals with special reference to preventive measures by the farm community. Canadian Veterinary Journal. Vol. 28 (1987) p. 261-263.